WHAT IS CLAIMED IS:

1. A thin-film magnetic head comprising:

an antiferromagnetic layer;

a pinned layer exchange-coupled to said antiferromagnetic layer so as to have a fixed magnetization direction;

a free layer having a magnetization direction changeable depending on an external magnetic field; and

a nonmagnetic layer disposed between said pinned layer and said free layer;

wherein a sense current flows in a thickness direction of said free layer;

said pinned layer including a multilayer part comprising:

a first layer formed from Cu;

a second layer formed from Cu and disposed closer to said free layer than is said first layer; and

an intermediate layer, disposed between said first and second layers while in contact therewith, comprising a partly oxidized ferromagnetic layer.

2. A thin-film magnetic head according to claim 1, wherein said oxidized part in said intermediate layer of said multilayer part is a ferromagnetic material.

3. A thin-film magnetic head according to claim 1, wherein said intermediate layer of said

multilayer part is formed from Fe or FeCo.

4. A thin-film magnetic head according to claim 1, wherein said pinned layer comprises a first ferromagnetic layer exchange-coupled to said antiferromagnetic layer so as to have a fixed magnetization direction while in contact with said antiferromagnetic layer, a second ferromagnetic layer having a magnetization direction opposite from that of said first ferromagnetic layer, and a nonmagnetic spacer layer disposed between said first and second ferromagnetic layers;

said multilayer part being included in said second ferromagnetic layer.

5. A thin-film magnetic head according to claim 1, wherein said multilayer part comprises a plurality of multilayer parts.

6. A thin-film magnetic head comprising:

an antiferromagnetic layer;

a pinned layer exchange-coupled to said antiferromagnetic layer so as to have a fixed magnetization direction;

a free layer having a magnetization direction changeable depending on an external magnetic field; and

a nonmagnetic layer made of Cu and disposed between said pinned layer and said free layer;

wherein a sense current flows in a thickness

direction of said free layer;

said pinned layer including a multilayer part comprising:

a first layer formed from Cu; and

an intermediate layer, disposed between said first layer and nonmagnetic layer while in contact therewith, comprising a partly oxidized ferromagnetic layer.

7. A head gimbal assembly comprising a thin-film magnetic head;

said thin-film magnetic head comprising:

an antiferromagnetic layer;

a pinned layer exchange-coupled to said antiferromagnetic layer so as to have a fixed magnetization direction;

a free layer having a magnetization direction changeable depending on an external magnetic field; and

a nonmagnetic layer disposed between said pinned layer and said free layer;

wherein a sense current flows in a thickness direction of said free layer;

said pinned layer including a multilayer part comprising:

a first layer formed from Cu;

a second layer formed from Cu and disposed closer to said free layer than is said first layer; and

an intermediate layer, disposed between said first and second layers while in contact therewith, comprising a partly oxidized ferromagnetic layer.

8. A hard disk drive comprising a thin-film magnetic head;

said thin-film magnetic head comprising:

an antiferromagnetic layer;

a pinned layer exchange-coupled to said antiferromagnetic layer so as to have a fixed magnetization direction;

a free layer having a magnetization direction changeable depending on an external magnetic field; and

a nonmagnetic layer disposed between said pinned layer and said free layer;

wherein a sense current flows in a thickness direction of said free layer;

said pinned layer including a multilayer part comprising:

a first layer formed from Cu;

a second layer formed from Cu and disposed closer to said free layer than is said first layer; and

an intermediate layer, disposed between said first and second layers while in contact therewith, comprising a partly oxidized ferromagnetic layer.

9. A thin-film magnetic head comprising:

an antiferromagnetic layer;

a pinned layer exchange-coupled to said antiferromagnetic layer so as to have a fixed magnetization direction;

a free layer having a magnetization direction changeable depending on an external magnetic field; and

a nonmagnetic layer disposed between said pinned layer and said free layer;

wherein a sense current flows in a thickness direction of said free layer;

said pinned layer including a multilayer part comprising:

a first layer formed from a nonmagnetic electrically conductive layer;

a second layer formed from a nonmagnetic electrically conductive layer and disposed closer to said free layer than is said first layer; and

an intermediate layer, disposed between said first and second layers while in contact therewith, comprising a partly oxidized ferromagnetic layer.

10. A magnetoresistive device comprising:

an antiferromagnetic layer;

a pinned layer exchange-coupled to said antiferromagnetic layer so as to have a fixed magnetization direction;

a free layer having a magnetization direction changeable depending on an external magnetic field; and

a nonmagnetic layer disposed between said pinned layer and said free layer;

wherein a sense current flows in a thickness direction of said free layer;

said pinned layer including a multilayer part comprising:

a first layer formed from a nonmagnetic electrically conductive layer;

a second layer formed from a nonmagnetic electrically conductive layer and disposed closer to said free layer than is said first layer; and

an intermediate layer, disposed between said first and second layers while in contact therewith, comprising a partly oxidized ferromagnetic layer.